

CLAIM LISTING

1. (Currently amended) Apparatus for monitoring fetal behaviour comprising:
 - (i) an input for receiving ECG data from a set of electrodes adapted to be attached to a maternal abdomen;
 - (ii) a waveform pre-processor for identifying a succession of fetal ECG complex waveforms within the received data;
 - (iii) a waveform processor for determining differences in the shapes of a succession of fetal ECG complex waveforms over time by at least one of the techniques of matching the ECG complex waveforms to a plurality of stored templates, phase detection, and integration; and
 - (iv) an event logger determining from the determined differences a number of fetal body movements ~~changes in fetal spatial presentation or position~~ during the period of time.
2. (Original) The apparatus of claim 1 further including a plurality of electrodes for positioning at different locations on the maternal abdomen.
3. (Original) The apparatus of claim 2 in which the number of electrodes is two.
4. (Original) The apparatus of claim 1 in which the waveform pre-processor includes a discriminator for discriminating between maternal ECG complexes and fetal ECG complexes in a received waveform.
5. (Previously presented) The apparatus of claim 4 in which the waveform pre-processor includes means for subtracting the maternal ECG complexes from the received waveform.

6. (Previously presented) The apparatus of claim 1 in which the waveform pre-processor comprises means for identifying a QRS complex in the fetal ECG data.
7. (Original) The apparatus of claim 1 in which the waveform processor comprises:
 - (i) a memory storing a plurality of fetal ECG complex templates each corresponding to a specific fetal spatial presentation and/or position;
 - (ii) a comparator for comparing each of the identified fetal ECG waveforms with a set of predetermined ones of the fetal ECG complex templates and determining at least one template from said set of templates that best matches each identified fetal ECG waveform.
8. (Previously presented) The apparatus of claim 7 in which the memory stores a plurality of fetal ECG complex templates each corresponding to a specific fetal spatial presentation and/or position relative to a specific one of a plurality of different electrode configurations.
9. (Original) The apparatus of claim 7 in which the event logger records occasions on which the determined template changes.
10. (Previously presented) The apparatus of claim 7 further including means for selecting the set of predetermined fetal ECG templates according to a preselected one of a plurality of configurations of ECG electrodes positioned on the maternal abdomen.
11. (Original) The apparatus of claim 7 in which the set of predetermined fetal ECG templates includes templates corresponding to at least cephalic presentation, breech presentation, shoulder dorsoanterior presentation and shoulder dorsoposterior presentation.

12. (Original) The apparatus of claim 1 in which the waveform processor comprises means for detecting phase changes between successive fetal ECG complex waveforms.
13. (Original) The apparatus of claim 12 in which the waveform processor comprises means for detecting phase changes of one or more predetermined magnitudes between successive fetal ECG complex waveforms.
14. (Previously presented) The apparatus of claim 12 in which the event logger records occasions on which a phase change occurs.
15. (Previously presented) The apparatus of claim 1 in which the waveform processor is adapted to determine differences in fetal complex waveforms by detecting change in the relative proportions of energy of a fetal ECG complex waveform above and below a baseline reference.
16. (Previously presented) The apparatus of claim 15 in which the baseline reference is the isoelectric line of a fetal ECG complex.
17. (Previously presented) The apparatus of claim 15 in which the reference is derived from a previous or average fetal ECG complex waveform.
18. (Currently amended) The apparatus of claim 1 further including a display for displaying a count of the number of fetal body movements ~~changes in fetal spatial presentation or position~~ detected.
19. (Original) The apparatus of claim 1 wherein the waveform processor further includes a fetal heart rate monitor.

20. (Currently amended) The apparatus of claim 1 further including an alarm for indicating if the number of ~~fetal body movements~~ changes in fetal spatial presentation or position during a period of time falls below a predetermined threshold.

21. (Currently amended) The apparatus of claim 1 further including a memory for storing fetal body movement data of events selected from the group consisting of changes in fetal spatial presentation or position event data and an electronic interface for downloading said event data to a remote device.

22. (Currently amended) A method for monitoring fetal behaviour comprising:

- (i) obtaining fetal ECG data over a period of time;
- (ii) identifying a succession of fetal ECG complex waveforms within the data;
- (iii) determining differences in the shapes of a succession of fetal ECG complex waveforms over time by use of at least one of the techniques of matching the ECG complex waveforms to a plurality of stored templates, phase detection, and integration; and
- (iv) determining from the determined differences a number of fetal body movements ~~changes in fetal spatial presentation or position~~ during the period of time.

23. (Original) The method of claim 22 in which step (i) comprises obtaining fetal ECG data from a plurality of electrodes positioned at different locations on the maternal abdomen.

24. (Original) The method of claim 23 in which step (ii) includes the step of discriminating between maternal ECG complexes and fetal ECG complexes in a received waveform.

25. (Original) The method of claim 24 in which step (ii) includes subtracting the maternal ECG complexes from the received waveform.
26. (Previously presented) The method of claim 22 in which step (ii) comprises identifying a QRS complex in the fetal ECG data.
27. (Original) The method of claim 22 in which step (iii) includes:
- (i) comparing each of the identified fetal ECG waveforms with a set of predetermined fetal ECG complex templates; and
 - (ii) determining at least one template from said set of templates that best matches each identified fetal ECG waveform.
28. (Original) The method of claim 27 in which step (iv) comprises determining the number of successive occasions on which the determined template changes during the period of time.
29. (Previously presented) The method of claim 27 in which the set of predetermined fetal ECG templates is selected according to a preselected one of a plurality of configurations of ECG electrodes positioned on the maternal abdomen.
30. (Original) The method of claim 27 in which the set of predetermined fetal ECG templates includes templates corresponding to at least cephalic presentation, breech presentation, shoulder dorsoanterior presentation and shoulder dorsoposterior presentation.
31. (Original) The method of claim 27 in which step (iii) comprises detecting phase changes between successive fetal ECG complex waveforms.

32. (Original) The method of claim 22 in which step (iii) comprises detecting phase changes of one or more predetermined magnitudes between successive fetal ECG complex waveforms.
33. (Previously presented) The method of claim 31 in which step (iv) comprises determining the number of successive occasions on which a phase change occurs during the period of time.
34. (Previously presented) The method of claim 22 in which the differences determined in step (iii) comprise change in the relative proportions of energy of a fetal ECG complex waveform above and below a baseline reference.
35. (Previously presented) The method of claim 34 in which the baseline is the isoelectric line of a fetal ECG complex.
36. (Previously presented) The method of claim 34 in which the reference is derived from a previous or average fetal ECG complex waveform.
37. (Currently amended) The method of claim 22 further including the step of displaying or logging a cumulative count of the number of fetal body movements ~~changes in fetal spatial presentation or position~~ within the period of time.
38. (Original) The method of claim 22 further including the step of monitoring fetal heart rate.
39. (Currently amended) The method of claim 22 further including the step of indicating an alarm condition if the number of fetal body movements ~~changes in fetal spatial presentation or position~~ during the period of time falls below a predetermined threshold.